

PATENT SPECIFICATION

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(54) OPEN END SPINNING MACHINE

(71) We, ZINSEK TEXTILMASCHINEN G.m.b.H., a German Company, of 7333 Ebersbach, Postfach 27, Germany, do hereby declare the invention, for which we pray
 5 that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an open end
 10 spinning machine comprising one or more housings, the or each of which incorporate a spinning rotor and its associated fibre feed and fibre separating rollers with shafts
 15 projecting from the housing in such a manner that by moving the housing, the shafts are brought into or out of engagement with machine-side drives.

In a known machine of this type (DT-OS 2 029 878) a number of such housings
 20 are supported on the machine so as to be rotatable about horizontally extending axes. Tools are required to fix the housing in this support. Its handling is particularly difficult if the housings have to be dis-
 25 posed close to each other along the machine to obtain a narrow machine spacing. In this case, it is particularly difficult to detach a housing from the row of hous-
 30 ings, e.g. in order to exchange it with another housing.

This need to use tools for assembly and possible dismantling also occurs in those
 35 known machines in which the spinning rotor and fibre feed and fibre separating rollers are not disposed in a common hous-
 40 ing but in two mutually tiltable housing sections supported on the machine (DT-OS 1 535 005), in which case two assembly or dismantling operations are required for
 45 each spinning unit.

In a further known machine (DT-OS 2 050 064), in which likewise the spinning
 50 rotor is accommodated in a first housing and the fibre feed and fibre separating rollers in a second housing, the two housings

are slidably supported on a guide formed
 from two uprights, and fixed in a sub-
 frame, which in its turn is fixed in a main
 frame of the machine. The two housings
 55 form a subassembly with the subframe connected to them by the uprights, which can likewise only be fixed to the machine or detached from it with the help of tools. Even if it is only required to exchange
 60 housings, after detaching the subassembly from the machine the exchange still has to be made in the subframe, for which tools have likewise to be used.

An object of the present invention is to
 65 provide an easily constructed support on the machine for a spinning unit accommodated in a single housing, which permits close machine spacing and into which the housing may be inserted or from which it may be detached without the aid of tools.

The invention provides: an open end
 70 spinning machine comprising a housing incorporating a spinning rotor and associated fibre feed and fibre separating rollers with shafts projecting from the housing for en-
 75 gagement with drive members, wherein the housing is slidably supported by an upright having one end fixed in a machine bed and locking members defining a releasable lock-
 80 ing device operative between the housing and upright are provided on the housing on the one hand and on the upright on the other hand.

In the simplest practical embodiment,
 85 the upright may be disposed with its longitudinal axis vertical and its free end upwards, the housing mounted thereon and protected against unintended detachment being able by its own weight to hold the
 90 shafts projecting from it in the horizontal direction in contact with their machine-side drives, e.g. with corresponding tangential drive belts conveyed to the machine.

Preferred features of the invention de-
 95 scribed in claims 2 and 3 make it possible

for the housing to be given different defined adjustment positions within its slide path on the upright, e.g. an operating position, a rest position and if necessary further intermediate positions.

One embodiment of the invention will now be described by way of an example with reference to the accompanying drawings in which:—

Figure 1 is a rear view of part of an open end spinning machine bed with a housing containing an open end spinning unit shown in the unit operating position;

Figure 2 is a horizontal section through a support which supports the housing on the machine bed, the section being taken on the line II-II of Figure 1;

Figure 3 is a horizontal section through the housing support on the line III-III of Figure 1;

Figure 4 is a partially broken away side view of the machine bed and housing of Figure 1;

Figure 5 is a view similar to that of Figure 4, but showing only part of the housing, in a different position relative to the machine bed;

Figure 6 is a view similar to that of Figure 5, also showing only a part of the housing but in a different position relative to the machine bed;

Figure 7 shows a part of the housing, detached from the machine bed.

Reference numeral 1 indicates a machine bed, if necessary built up in parts, extending along an open end spinning machine, and on which closely adjacent analogously formed housings 2 are movably supported, the figure showing only one of such housings. Each of the housings 2 comprises a cover and contains an open end spinning unit, of which Figures 1 and 4 only show a fibre separating roller 3 and a spinning rotor 4, having driven shafts 5 and 6 respectively projecting from the housing 2 into engagement with tangential drive belts 7 and 8 running along the machine. For clarity in the drawings, the other components of the spinning unit situated in the housing, namely the fibre feed roller and the ducts connecting the components together and still further components are not shown. The components may also be mutually associated in any other manner than that shown.

Each of the housings is slidably supported on the machine bed by an upright 9 with one of its ends fixed into the bed 1, the housing 2 with a corresponding guide being slidably mounted on a free-standing part of the upright 9. In the figures, the cylindrical upright 9 is fixed into the bed with a press fit, but other methods of fixing, e.g. by pinning or screwing, are pos-

sible. The housing may be directly guided on the upright by a bore in the housing fitting the upright. However, in the embodiment shown by way of example, the housing 2 contains a recess with portions of different but larger width than the diameter of the upright 9, and two bushes 10 and 11 which slide on the upright 9 are fixed in these recesses. A portion 12 of the bush 10 projects from the housing 2 and engages, in the positions shown in Figures 1, 4 and 5, in a suitable recess 13 in the machine bed 1 coaxial with the upright 9, this engagement being sealed by an elastic ring 14 mounted on the piece 12.

The housing 2 slidably mounted on the upright 9 is held against withdrawal from the upright by a releasable locking device. In the illustrated example, in which the longitudinal axis of the upright 9 is vertical and the upright is fixed to the bed 1 with its free portion pointing downwards, the locking device prevent the housing 2 from falling off the upright 9. The danger of its falling is not present in the case of other possible upright arrangements, e.g. where the upright has its free end projecting upwards or is fixed with its longitudinal axis horizontal.

One of the locking members of the locking device is formed by the free ends projecting from the upright 9 of a stop pin 15 fixed into the upright, the opposing locking member being a ring 16 surrounding the upright 9 and supported rotatably in the housing 2, the ring, as shown in Figure 3, comprising two opposed axial recesses 17 which by corresponding rotary adjustment of the ring relative to the upright, cause the ring to slide axially in the region of the stop pin 15. In the indicated adjustment position of the ring 16, the pin 15 limits the axial sliding of the ring 16 on the upright 9, and if the ring 16 is limited in its axial movement or unslidable in the housing 2, then the housing movement is limited on the upright 9. The pin 15 makes it necessary, for the mounting of the housing 2 on the upright 9 or its withdrawal from it, to provide the bushes 10 with corresponding axial slots 18. The parts 15, 16, 17, which are formed and operate as a bayonet locking mechanism, may be associated with each other in such a manner that in its locked position, the housing 2 is held in firm contact with the machine bed 1, the driven shafts 5 and 6 lying simultaneously against the belts 7 and 8.

As shown in the figures, the ring 16, provided with an adjusting handle 19, is axially slidably supported in one of the recessed portions of the housing 2. A compression spring 20, also inserted into this portion, is supported at one end by the edge of the housing located at the end of

this recessed portion, and at the other end by the ring 16, the end of the spring making contact not directly with the ring 16 but with a fork-like lug overlying the ring and formed by an angular end 21 of a flat slide plate 22. The slide plate 22 is supported in the housing by a screw 24 fitting through a longitudinal aperture 23 in the plate 22. In the position of the components shown in Figure 6, the spring 20 presses the ring 16 into contact with the bush 11. The flat slide plate 22, correspondingly pressed by its end 21, therefore comes into proximity to one of the limits of its slide path fixed by the pin and slot guide 23, 24. If the housing 2 is slid manually from the position shown in Figure 6 into contact with the machine bed 1, the ring 16 reaches a position, with respect to the stop pin, in which this latter, after passing through the ring recesses 17 and corresponding recesses in the lugs of the slide plate end piece 21, lies under the initial region of opposing axial inclined faces 25 of the ring 16. On locking, by turning the ring 16 by means of the handle 19, the inclined surfaces 25 run upwards on the free ends of the stop pin 15, by which, under the compression of the spring 20 and corresponding movement of the flat slide plate 22 in its guide, the ring 16 is detached from the bush 11. When the ring 16 is turned until the lateral boundary edges of the inclined surfaces 25 make contact with the pin 15, the components take up the position shown in Figure 4, in which the ends of the inclined surfaces 25 provided with an indentation (see particularly Figure 6) lightly rest on the pin 15. The spring 20 pushes at one end on the pin 15 by way of the angled slide plate end piece 21 and ring 16, and consequently on the upright 9, and pushes with its other end against the housing 2 with its wall in contact with the machine bed 1. In this first housing position, the shafts 5 and 6 are in contact with the belts 7 and 8 as already stated, and likewise the known drive for the yarn feed device, not shown for reasons of clarity, is coupled to machine side drives.

As can be seen from Figures 1 and 4, tubes 26, 27 and 28 project from the wall of the housing 2 facing the machine bed 1 and engage in corresponding recesses 29, 30 and 31 respectively of the machine bed 1, each by way of an elastic sealing ring. These tubes and the corresponding recesses form parts of supply lines between the machine and the housing 2, the recesses being connected to air lines 32, 33 and 34 extending along the machine bed 1.

The line 32 is connected to an air suction generator, and the region comprising the spinning rotor 4 and fibre separating

roller 3 is supplied with the necessary suction for the spinning process through the line portions 29 and 26. The interior of the spinning rotor may be supplied with compressed air from the line 33 through the line portions 27 and 30 for cleaning purposes.

The line portion 28 is connected to a chamber 35 associated with the fibre separating roller 3, and in which refuse from the sliver collects for removal by a continuous or intermittent air suction current in the line 34 and consequently in the portion 31.

In addition to the above-mentioned lines, further similar supply lines may be provided, e.g. one for supplying an air-supported spinning rotor and/or delivery roller with the necessary bearing air. Electrical connections by means of plugs and sockets or other releasable contacts may be likewise provided between the machine and housing, e.g. for a yarn breakage detector or other monitoring and switching devices.

The mutually telescopic engagement of the supply line portions constitutes a protection against the rotation of the housing 2 relative to the machine bed, if the upright 9 is cylindrical. This protection may however be obtained by corresponding shaping of the upright profile.

The already mentioned engagement of the bush portions 12 in the bed recesses 13, which are connected in their turn to an air line 36, means that if compressed air is fed to the line 36, the portion 12, in the form of a piston, slides in the recess 13, in the form of a cylinder. With sufficiently high pressure, the housing 2, by overcoming the force of the compression spring 20, is moved from its contact with the bed 1 to the second position shown in Figure 5, determined by the contact of the screw 24 against one of the end edges of the longitudinal aperture 23. The flat side plate 22 supported firmly on the upright 9 by the ring 16 and pin 15 is provided with two lugs 37 and 38 disposed in such a manner that on this movement of the housing 2, the shafts 5 and 6 projecting from it come into contact with brake shoes 39 and 40 fixed to the free ends of the resilient lugs 37 and 38, by which the movement of the fibre separating roller 3 and spinning rotor 4 is braked.

During this movement of the housing, the supply lines extending between the machine bed 1 and housing 2 remain in existence because of the mutual telescopic engagement of their parts, so that the said cleaning can be provided by air feed through the lines 33 and 34.

The compression spring 20 again slides the housing 2 into the operating position for the spinning unit shown in Figures 1

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and 4 on reducing or interrupting the air pressure in the line 36.

The device heretofore described makes it possible to fix the housing 2 to the upright 9 in a releasably locked manner and to set it mechanically in either an operating or a rest position.

With the possible tightly adjacent disposition of the housings 2, the machine compartment lying behind the row of housings and containing the belts and their guide parts is covered by the row of housings and may not be accessible for maintenance or the like. In order to have comfortable access to this compartment without having to displace housings from their positions on the uprights, the housing are given a third adjustment position on the uprights in addition to the two above-mentioned positions.

To this end, the flat slide plate 22 is provided with a further angular end piece 41, which in a manner similar to its opposing end piece 21 extends as a fork on the two sides of the upright 9, as shown in Figure 2. When the lock existing between the ring 16 and stop pin 15 is released by turning the ring 16, the housing 2 may slide up the upright 9 until the end piece 41 meets the stop pin 15. The end piece 41 is thus the second counter locking member for the locking member formed by the stop pin 15, and in this lock 15, 41 shown in Figure 6 between the housing 2 and upright 9, the machine compartment containing the belts and their guide and tightening members is comfortably accessible through the then relatively wide gap between the machine bed 1 and the housing or housings 2. In the housing movement from the second (Figure 5) to the third (Figure 6) position the tubes 26, 27, 28 become released from their engagement in the recesses 29, 30 and 31, so that the supply lines are no longer in existence.

To detach the housing 2 from the upright 9, to reach the condition shown in Fig. 7, the lock 15, 41 is opened by moving the handle 42 of plate 22 as far from the housing 2 as necessary for the end piece 41 to come free from the stop pin 15. Instead of this type of lock, a lock of the bayonet lock type may be used, as in the case of the ring 16. Thus instead of the end piece 41 bent into the housing 2 from the slide plate, a disc rotatably adjustable by a handle could for example be used, which in one adjustment position covers the pin 15 and in another adjustment position does not cover the pin 15.

On the other hand, both end pieces of the flat slide plate 22 could be in the form of resilient parts deflectable from the housing 2, in which case the ring 16 could be eliminated as its function would be taken

over by an end piece of the same form and action as the end piece 41.

WHAT WE CLAIM IS:—

1. An open end spinning machine comprising a housing incorporating a spinning rotor and associated fibre feed and fibre separating rollers with shafts projecting from the housing for engagement with drive members, wherein the housing is slidably supported by an upright having one end fixed in a machine bed and locking members defining a releasable locking device operative between the housing and upright are provided on the housing on the one hand and on the upright on the other hand.

2. A machine as claimed in Claim 1, wherein the locking device is formed as a stop for limiting sliding of the housing on the upright.

3. A machine as claimed in Claim 2, wherein at least two counter-locking members, spaced apart in the sliding direction of the housing on the upright are associated with a locking member of the locking device.

4. A machine as claimed in Claim 3, wherein one of the two counter-locking members is connected to a support member supported for limited sliding relative to the housing in the direction of sliding of the housing.

5. A machine as claimed in any one of Claims 1 to 4, wherein a first device associated with the housing urges the housing in one sliding direction, and a second selectively operable device associated with the housing urges the housing in the opposite sliding direction, said second device being formed to overcome the force of the first device.

6. A machine as claimed in Claim 5, wherein the first device is an energy accumulator and the second device is a pneumatic adjusting device.

7. A machine as claimed in Claim 6, wherein the energy accumulator is a compression spring.

8. A machine as claimed in Claim 7, wherein the compression spring is disposed surrounding the upright with one end supported by the housing and the other end supported by a locking member of the locking device provided on the upright.

9. A machine as claimed in Claim 6, wherein the pneumatic adjusting device is a compressed air generator and an actuator unit consisting of a cylinder and piston provided in the housing and machine bed respectively.

10. A machine as claimed in Claim 9, wherein the piston consists of a portion which projects from the housing and the cylinder consists of a portion formed in the machine bed.

11. A machine as claimed in Claims 9 and 10, wherein the piston consists of a part of a bush projecting from the housing and which forms a guide for the housing on the upright, and the cylinder consists of a recess formed in the machine bed wall co-axial to the upright.

12. A machine as claimed in any one of Claims 1 to 11, wherein one locking member consists of a member disposed in proximity to a free end of the upright and projecting therefrom, and the other locking member consists of a first counter-locking member comprising two bent ends of a slide plate held on the housing by a pin and slot guide arrangement.

13. A machine as claimed in Claim 12, wherein the slide plate is a resiliently formed member such that at least one of its ends forming the other locking member is movable manually with respect to said one locking member into an unlocking position.

14. A machine as claimed in Claims 12 and 13, wherein the other locking member further includes a second counter-locking member comprising a ring embracing the upright and supported at a bent end of the slide plate and which, in the manner of a bayonet lock, contains counter-bayonets complimentary to formations on said one locking member.

15. A machine as claimed in any one of Claims 1 to 14, wherein supply lines between the machine and the housing are in the form of line portions disposed on the one hand on the bed and on the other hand on the housing said portions being telescopically engageable in the direction of movement of the housing relative to the machine.

16. A machine as claimed in Claim 15, wherein the respective line portions fit into each other with the interposition of an elastic gasket.

17. A machine as claimed in Claims 15 and 16, wherein the line portions are disposed in mutually facing walls of the machine bed and housing.

18. A machine as claimed in any of Claims 15 to 17, wherein the line portions are arranged to mutually engage only over part of the range of movement between the housing and machine bed.

19. A machine as claimed in any one of Claims 15 to 18, wherein at least one of the supply lines formed from the line portions is arranged as a further means of locating the housing relative to the

machine bed and extends with its axis parallel to the upright.

20. A machine as claimed in Claims 1 to 19, wherein the locking members, and adjusting devices for the housing are so formed and mutually associated that in a first position of the housing on the upright in which the housing is prevented from detachment from the upright by engagement between the one locking member and the second counter-locking member, the housing is maintained by elastic force with one of the walls in contact with a counter surface of the machine bed and, at the same time, with the shafts projecting from the housing engaged with machine-side drives, and in a second position of the housing on the upright, defined by one of the limits of the pin and slot guide of the slide plate and obtained by the pneumatic adjusting device forcibly overcoming the elastic force, the shafts projecting from the housing are released from their engagement with the machine-side drives, and after the release of the engagement between the one locking member and second counter-locking member and the making of the engagement between the one locking member and the first counter-locking member the housing, protected against detachment from the upright is held in a third position on the upright, and after release of this latter lock the housing may be withdrawn from the upright, whereby the engagement between the line portions which establishes the supply line between the machine and housing in the first and second housing position is broken when the housing moves into the third position.

21. A machine as claimed in Claim 20, wherein lugs are disposed on the slide plate and carry brake shoes associated with the shafts projecting from the housing.

22. A machine as claimed in any one of Claims 1 to 21, wherein the upright projects downwardly from the machine bed with its longitudinal axis vertical.

23. An open end spinning machine substantially as herein described with reference to the accompanying drawings.

MARKS & CLERK.

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COMPLETE SPECIFICATION

3 SHEETS

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the Original on a reduced scale.

SHEET 1

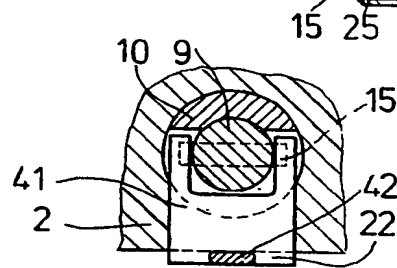
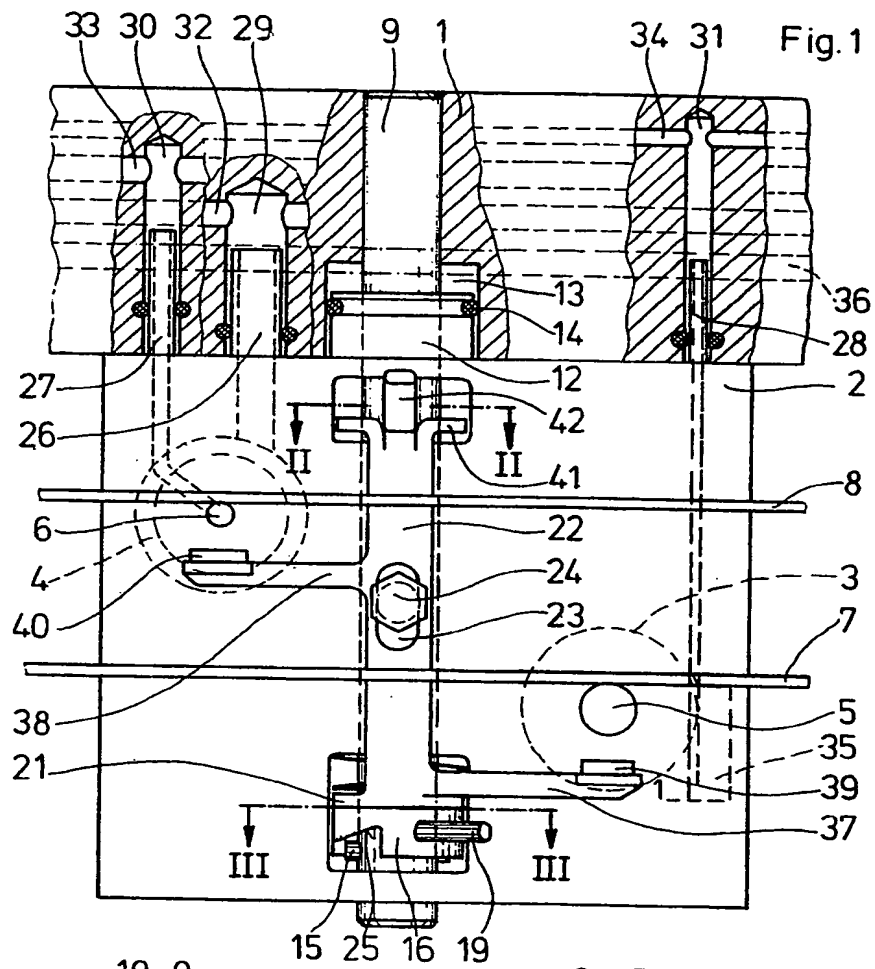


Fig. 2

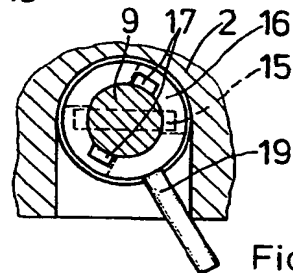


Fig. 3

Fig. 4

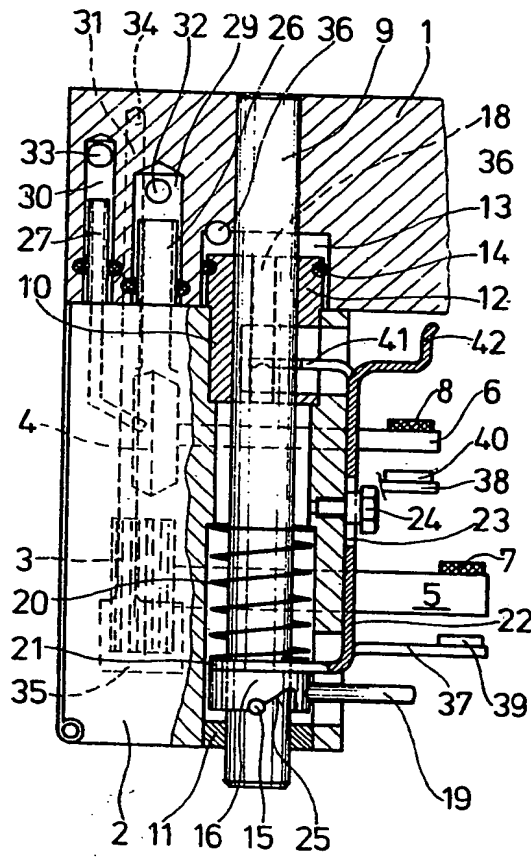
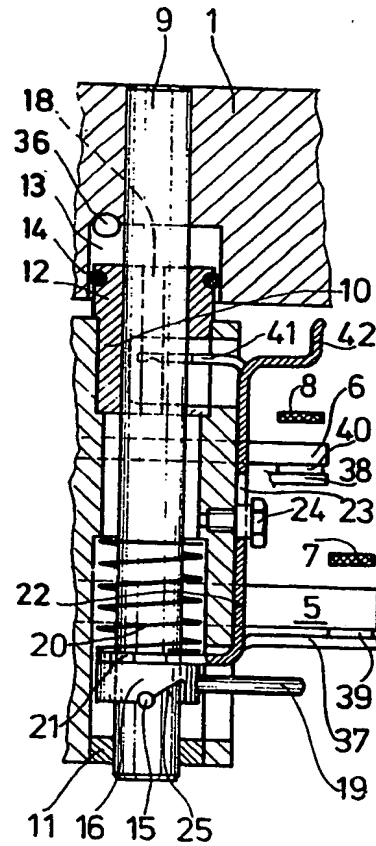


Fig. 5



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3 SHEETS

COMPLETE SPECIFICATION

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SHEET 3

Fig. 6

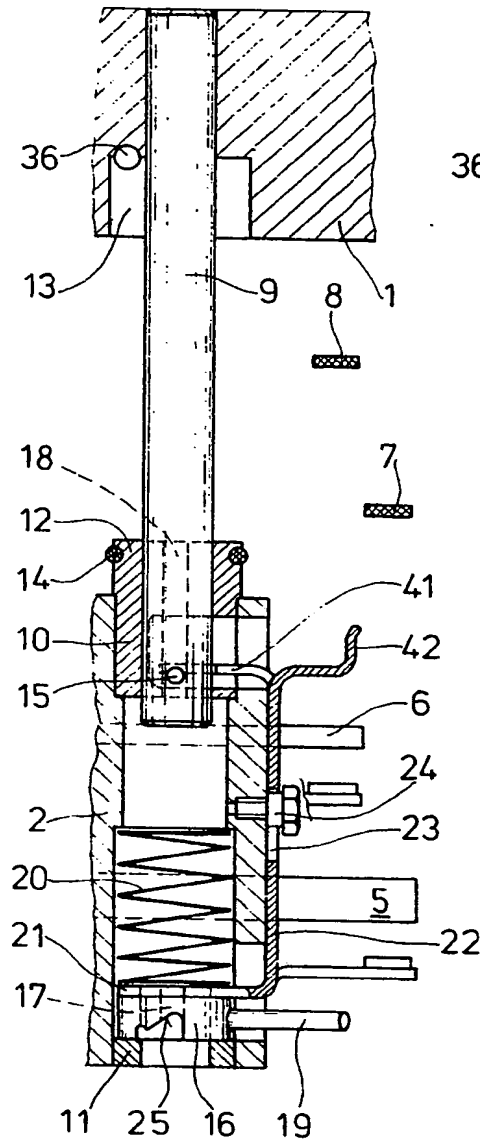


Fig. 7

